

## PATENT COOPERATION TREATY

## PCT

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY



(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

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Applicant's or agent's file reference .....	<b>FOR FURTHER ACTION</b>		See Form PCT/PEA/416
International application No. PCT/CZ2004/000049	International filing date (day/month/year) 23.08.2004	Priority date (day/month/year) 01.09.2003	
International Patent Classification (IPC) or national classification and IPC C07C2962, C07C31/36			
Applicant SPOLEK PRO CHEMICKOU A HUNTI VYROBU, AKCIOVA ...			
<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 7 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input checked="" type="checkbox"/> sent to the applicant and to the International Bureau a total of 3 sheets, as follows:</p> <p><input checked="" type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input checked="" type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>			
<p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the opinion</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input checked="" type="checkbox"/> Box No. VIII Certain observations on the international application</p>			
Date of submission of the demand  27.06.2005		Date of completion of this report  16.11.2005	
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465		Authorized Officer  Grammenoudi, S Telephone No. +49 89 2399-8324 	

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**INTERNATIONAL PRELIMINARY REPORT  
 ON PATENTABILITY**

International application No.  
 PCT/CZ2004/000049

**Box No. I Basis of the report**

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
  - ☐ This report is based on translations from the original language into the following language, which is the language of a translation furnished for the purposes of:
    - ☐ international search (under Rules 12.3 and 23.1(b))
    - ☐ publication of the international application (under Rule 12.4)
    - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the **elements\*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

**Description, Pages**

1-8 as originally filed

**Claims, Numbers**

1-16 filed with telefax on 27.06.2005

- ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing
3. ☐ The amendments have resulted in the cancellation of:
    - ☐ the description, pages
    - ☐ the claims, Nos.
    - ☐ the drawings, sheets/figs
    - ☐ the sequence listing (*specify*):
    - ☐ any table(s) related to sequence listing (*specify*):
  4. ☒ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
    - ☐ the description, pages
    - ☒ the claims, Nos. 12-16
    - ☐ the drawings, sheets/figs
    - ☐ the sequence listing (*specify*):
    - ☐ any table(s) related to sequence listing (*specify*):

\* If item 4 applies, some or all of these sheets may be marked "superseded."

**INTERNATIONAL PRELIMINARY REPORT  
ON PATENTABILITY**

International application No.  
PCT/CZ2004/000049

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**Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

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1. Statement

Novelty (N)	Yes: Claims	1-11,16
	No: Claims	12-15
Inventive step (IS)	Yes: Claims	
	No: Claims	1-16
Industrial applicability (IA)	Yes: Claims	1-16
	No: Claims	

2. Citations and explanations (Rule 70.7):

**see separate sheet**

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**Box No. VIII Certain observations on the international application**

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The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

**see separate sheet**

D1= US-A-2 144 612  
D2= WO-A-02/50014  
D3= JP-A-03 056 430  
D4= EP-A-0 781 760  
D5= US-A-6 072 076  
D6= US-A-2 198 600

## SECTION V

1. The present application relates to a process for producing 1,3-dichloro-2-propanol and 2,3-dichloro-1-propanol by hydrochlorination of glycerine and/or monochloro-propanediols.
2. The amendments filed with the letter dated 25.06.2005 introduce subject-matter which extends beyond the content of the application as filed, contrary to Article 34(2)(b) PCT. The amendments concerned are the features "vertical cylinder" and "in which there is located a vacuum distillation column downstream of the reactor" of claim 12, "vacuum distillation device" and "located downstream the vacuum distillation column" of claim 13 and "vacuum distillation devices located down-stream the individual steps of the cascade" of claim 14, said features originating from Examples 1-4. However, the apparatuses used in Examples 1-4 include further constructional elements which has been omitted from present claims 12-16. For instance, the apparatus of Examples 1, 3 and 4 uses a dispersing device (cf. page 6, line 4, page 7, line 12 and page 8, line 6), a pump (cf. page 6, line 7, page 7, line 15 and page 8, line 12), an evaporator (cf. page 6, line 10, page 7, line 18 and page 8, line 14) and a tank (cf. page 6, line 14, page 7, line 22 and page 8, line 18). The cascade according to Example 2 consists of three reactors (cf. page 6, line 19), wherein the first member of the cascade is a tower reactor of the liquid-gas type (cf. page 6, line 22). It also includes a dispersing device (cf. page 6, line 23) and a tank (cf. page 6, line 25). Such generalisation of the specific examples by selecting certain particular features therefrom and incorporating them into broadly defined claims represents an unacceptable extension of the application as originally filed.

For the purpose of the following examination, the aforementioned inadmissible

amendments of claims 12-14 are not taken into account.

3. The process according to present claims 1-11 is novel over the methods known from D1 and D6 by using a solvent-free reaction medium and a distillation under reduced pressure respectively. Thus, the subject-matter of claims 1-11 meets the requirements of Article 33(2) PCT.
4. For claims directed to physical entities such as apparatuses, characteristics of a particular intended use cannot be considered as technical features in determining novelty (cf. PCT Guidelines IV-7.6.). Thus, the expressions "for carrying out the method of any claims 1-9" and "for continuous returning .... as a distillate" used in claim 12, "for continuous returning .... as distillate" of claim 13, and "for carrying out the method of claims 10 or 11" and "for distilling off the water of reaction and a part of the dichloropropanol product" of claim 14 have no limiting effect on the claim's scope. The apparatuses according to present claims 12-15 are well known from the art (cf. D2, page 7, lines 1-28, Fig. 1; D3, Figures 1 and 2; D4, page 8, lines 1-26, Fig. 1; D5, column 5, lines 4-42, Fig. 1).  
Accordingly, the subject-matter of claim 12-15 lacks novelty, thereby not meeting the requirements of Article 33(2) PCT.
5. The apparatus of claim 16 appears to be novel and satisfies therefore the requirements of Article 33(2) PCT.
6. Documents D1 and D6 cited in the description on page 2, line 25 and page 3, line 1 are considered to represent the closest state of the art. D1 discloses a continuous process for the production of glycerol dichlorohydrin which differs from the claimed method in that the reaction is performed in the presence of an inert, water-immiscible solvent in order to continuously distill out the reaction water (cf. D1, page 1, left-hand column, line 48 - right-hand column, line 35, Examples 1-6), and in that the distillation is carried out under atmospheric pressure instead of at reduced pressure. Although the practical examples of D1 are focused on the manufacture of glycerol dichlorohydrin as a batch process under atmospheric pressure, the document contains unequivocal statements that the reaction may be carried out

under subatmospheric (reduced) pressure (cf. D1, page 3, left-hand column, lines 60-65) and in a continuous manner (cf. D1, page 3, right-hand column, lines 25-48). It is self-evident that the aforementioned continuous distillative removal of the reaction water, an essential feature of the process according to D1, will be maintained in such a continuous mode of operation. The distinction between the claimed process and that of D6 resides in the fact that this document does not mention the possibility of working continuously and distilling at reduced pressure.

7. The problem to be solved by the present application with respect to the cited prior art is to provide a further process for the manufacture of the dichloropropanols 1,3-dichloro-2-propanol and 2,3-dichloro-1-propanol. In view of the background art disclosed in D1 and D6 (cf. D1, page 1, left-hand column, lines 19-29, D6, page 1, left-hand column, lines 17-42) as well as the invention according to D6 (cf. D6, Example 1), it would be obvious for the skilled person to continuously react glycerol with hydrogen chloride in a solvent-free reaction medium and distilling out the water of the reaction, thereby continuously producing a mixture of the dichloropropanol product, water, acetic acid catalyst and hydrogen chloride. Taking into account D1 and common general knowledge, one skilled in the art would also contemplate carrying out the distillation at reduced pressure, especially as the advantages thus achieved such as lower distillation temperatures and more effective removal of the reaction water can readily be foreseen. Indeed, the claimed process does not appear to be associated with any unexpected advantages or surprising effects when compared to the state of the art. According to Example 3 of D1, dichloropropanol is isolated as a pure product with a yield of 91%. In contrast, a mixture of the dichloropropanol product, water and hydrogen chloride is produced by the process of Example 1 of the present invention, the calculated yield of 1,3-dichloro-2-propanol and 2,3-dichloro-1-propanol being 95.6%. As disclosed in D1 and D6, dichloropropanol is not conveniently obtainable from these solutions and it is impossible to separate more than a portion thereof by distillation. The only effective methods for producing pure dichloropropanol require that solvent be used, either directly in the reaction mixture (cf. D1) or for extracting the dichloropropanol product from the distillate (cf. D6). The applicant has failed to provide evidence (comparative experiments) indicating that the claimed process is more effective in terms of yield or other relevant parameters than the method of the art.

For this reason, the subject-matter of claim 1 does not meet the requirements of Article 33(3) PCT.

8. Claims 2-11 and 16 do not appear to contain any features which, in combination with the features of any claim to which they may refer, meet the requirements of the PCT in respect of inventive step. The apparatus of claim 16 can only be accepted if the process using this cascade for the production of dichloropropanol is deemed allowable.

#### **SECTION VIII**

1. The expressions "etc." (cf. page 4, line 22) and "and the like" (cf. page 5, lines 6, 8 and 18) render the scope of the application unclear (Art. 6 PCT).
2. It would appear that the experiment described in Example 2 does not represent a continuous process (cf. page 6, lines 25-28). Thus, the example extends beyond the scope of claim 1 and should have been denoted as an example not falling within the scope of the invention (Art. 6 PCT).